

Training Program in Stem Cell Biology and Engineering

Grant Award Details

Training Program in Stem Cell Biology and Engineering

Grant Type: Research Training II

Grant Number: TG2-01151

Project Objective: The objective of this program is to provide stem cell training and expertise to pre-doctoral students and and postdoctoral fellows at UC Santa Barbara. The program specializes in basic stem cell science and bioengineering.

Investigator:

Name:	Dennis Clegg
Institution:	University of California, Santa Barbara
Type:	PI

Award Value: \$2,448,823

Status: Closed

Progress Reports

Reporting Period: Year 4

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Reporting Period: Year 5

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Reporting Period: Year 6+NCE

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Grant Application Details

Application Title: Training Program in Stem Cell Biology and Engineering

Public Abstract:

We propose to continue our successful interdisciplinary Training Program in Stem Cell Biology and Engineering (CIRM Type III). The program will educate the next generation of stem cell researchers and provide the ethical background and research skills necessary for them to succeed in this rapidly moving, multifaceted field. The training grant will support research in two broad but interrelated areas: 1. Inquiries into the fundamental molecular biology of stem cell proliferation and differentiation, using powerful methods of modern molecular biology. 2. Bioengineering approaches will be used to develop novel biotechnologies for stem cell research, taking advantage of state of the art research and facilities. Postdoctoral and pre-doctoral trainees will be immersed in a highly interactive and supportive program that facilitates research and instruction in stem cell biology and engineering. Trainees will be involved in groundbreaking research that will solve key problems and help bring stem cell therapies into practice. We will continue very successful courses initiated in the previous funding period, in stem cell biology and stem cell ethics. The training environment will be enriched by seminars from visiting researchers, multiple journal clubs, internal research seminars, video conferencing to collaborating institutions, and attendance at national and international scientific meetings. In the current proposal, we have added additional PIs and expanded the training opportunities for CIRM scholars. Training will be strengthened with participation by CIRM scholars in the CIRM Bridges program with two nearby institutions, to provide mentoring and leadership experience. A new seminar series will be initiated that features novel, interdisciplinary biotechnologies, and instruction will be improved and expanded with new teaching technologies. The training program will be augmented by the considerable investment of the campus, including renovation of new facilities, funding of graduate and postdoctoral activities, and recruitment of new stem cell faculty members.

Statement of Benefit to California:

California, like much of the United States, is facing a staggering challenge to its health care system. A perfect storm of soaring medical costs and the aging of the population augers poorly for the economic future of health care as we know it. Increasingly physicians are treating chronic, debilitating, and therefore expensive diseases with organ specific impairments. The demographic wave of the Baby Boomers will accelerate many of these issues. By 2020 they will average 64 years of age. As a result, the percentage of elderly in California is expected to grow from what was 14 percent in 1990 to 22 percent in 2030. Chronic degenerative diseases, which tend to afflict an aging population, represent a proportionally high percentage of individuals in California. Major innovative approaches are now, more than ever, an imperative. Our stem cell program, with its emphasis on enabling technologies, has the potential to make an impact upon many of these conditions. Degenerative diseases are those diseases caused by the loss or dysfunction of cells. Examples include cardiovascular disease, osteoarthritis, Parkinson's disease, osteoporosis, diabetes, and macular degeneration. Among these conditions, stem cell work at our institution would leverage a strong existing program in macular degeneration, a condition that is just beginning to be addressed in the stem cell field. However, further research in molecular biology and engineering is needed to bring forward new therapies. There is a great need to train young scientists in stem cell biology and engineering to prime the engine of innovative research. We propose a Type III Training Program to educate the next generation of stem cell researchers, with an interdisciplinary focus on stem cell biology and engineering. This highly interactive mix holds a great deal of promise for the opening of stem biology to the bioengineering community, and the development of materials and devices for the stem cell field. This program will benefit the people and state of California by providing top quality scientific and ethical training to young researchers who will go on to develop cellular therapies for debilitating disease. In addition to the medical potential of stem cells and the spear heading of interdisciplinary work, our program will also bring economic benefits to the state. Multiple collaborations with industry have already emerged from our program in a very short time, stimulating growth of the California biotechnology industry.